Method, System and apparatus for using mobile telephone and GPS receiver to inexpensively access the server based GIS context for navigation operations

DESCRIPTION

[Para 1] Field of Invention

The present invention relates to integrating a mobile telephone and a GPS receiver and a method capable in converting coordinates to touch-tone signals, text or voice messages, which are communicated to a GIS server to make GIS and navigation information available to mobile telephone users in a convenient and inexpensive way.

[Para 2] Description of the Related Art

Computerized mapping and real-time communication software are independently achieving widespread use today. Such mapping programs are commonly used to automate tasks of calculating routes, viewing location-specific geographical areas for their spatial content, such as addresses, roadways, rivers, etc., and for the purpose of being used with Global Positioning System (*GPS*) devices for various applications, such as a personal navigation application. Mapping software programs apply to a wide variety of uses, such as personal navigation, telemetric, thematic mapping, resource planning, routing, fleet tracking, safety dispatching (i.e., Police, Fire, and Rescue organizations), and a wide variety of specialized Geographic Information System (*GIS*) applications, all of which are well known to people skilled in the art.

Prior art applications provide various features, such as displaying driving directions (i.e., routes), Points Of Interest (POI), waypoints (such as personalized, user-specific, points on a route or along a track), etc.. To aid such navigation, special device is usually engaged such as a GIS capable palm computer or a dedicated GIS displayer. A typical user feeds-in the POI, the

device calculates the distance from the current GPS coordinates and gives real-time directions to the destination. This system requires a GPS ready device with built in GIS database such that the GPS coordinates can be mapped to the GIS. Since the GIS information is saved on a local device and the software to map GPS coordinates to GIS reside on one local unit, the unit becomes expensive. Additionally it requires to carry this extra unit to be able to access the GIS.

Current applications that integrate both mapping and real-time messaging are well known in the art, such as the Automatic Vehicle Location (AVL) or Fleet Tracking industry, where vehicles that have position devices, such as *GPS,* report their position to a centralized computer for the mapping and display of the vehicles' locations. Some of these prior art systems may incorporate real-time messaging for the transfer of logistical information, such as pickup and drop-off status messages. However, these existing applications do not provide a method for dynamically transferring location-relevant information to a device such as a mobile telephone without the local GIS, Graphical User Interface (GUI) and software to map GPS to GIS.

Mobile devices typically use location telemetry devices to transmit their location in a pre-defined manner or by request, by using a set of preferences to automatically request position updates. These preferences are based on various parameters, such as reporting location updates based on the distance traveled by the vehicle or by using various time intervals to trigger position updates either by a push or pull method relative to the telemetry device.

One of the problems with the AVL solution is that most applications are browser based, requiring maps, which are either GUI or Character Based. Such applications are widespread with mobile devices such as the ones manufactured by Garmin, and MapQuest Corporation. There are also software applications such as Microsoft MapPoint to lead a user to a POI. This prior art fails to use the existing mobile telephone devices not equipped with GUI, GPS and mapping software explained above.

Another problem with the prior art, such as the case of AVL software solution is that the mobile device is limited in its functionality by such practical aspects as the limited size of portable hard disk, memory and software functionality. For example, the device may only be able to hold the detailed maps of some routes of North America but not necessarily fleet vehicle sea maps. The POI enabled mobile device and software tends to be relatively larger and extra piece to carry as most of the people using this device also uses a mobile telephone - relatively smaller and inexpensive equipment.

Also, the device that is equipped to direct in English will be of little use for a traveler operating the device in Japan without changing the language option. The GIS server based solution offers a centralized database with a potentially very large data storage, many more GIS applications and features. Once engaged in session, a user can opt for such preferences such as a language of choice or level of details in GIS. The prior art also falls short for travelers outside the geographical bounds of the installed maps, or those who require different application based on the geographical context of the POI.

The current art cannot effectively track the use of GIS features. The proposed model not only gives expanded GIS features, but also provides a way of offering pay per use of the service.

The current art does not allow a standard mobile telephone to offer POI information or navigation capabilities to a user.

Thus, a need exits for a method and system that allows users with a mobile telephone to send, request, and plan, in real time, location relevant information. Until now, an adequate solution to these problems is confined to a smaller user population having a GUI capable POI device. This solution is limited in its functionality. Providing a solution enabling users to send, request, and plan, in real time, location relevant information would prove especially useful for wireless mobile phones that incorporate a GPS device.

This provides great benefits to wireless telephone users as they can use the mobile telephone to harness the information currently only available to the in-vehicle navigational systems (i.e., telematics) and fleet tracking systems. They would be able to make use of the existing infrastructure of the mobile telephone and much larger application support from the GIS server.